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EXAMINER	
FAN, CHIEH M	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/511,470	Applicant(s) BOBIER, JOSEPH A.	
	Examiner Chieh M Fan	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54,62 and 63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *49-54* is/are allowed.

6)☒ Claim(s) *1-3,5-9,19-32,35-38,41-44,47,48,62 and 63* is/are rejected.

7)☒ Claim(s) *4,10-18,33,34,39,40,45,46,51-53* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 February 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1-25, 31, 32, 43, 44, 62 and 63 are objected to because of the following informalities:

Regarding claims 1-25, it appears "an integer number of wavelet" in line 12 of claim 1 (line 2 of step (d)) should be changed to --- an integer number of wavelets ---; and "the interval" in line 15 of claim 1 should be changed to --- an interval ---.

Regarding claim 31, "a said wavelet" in line 8 should be changed to --- a wavelet --- since the exact term "wavelet" has not been recited before in the claim; "a said crossover position in lines 13-14 should be changed to --- a zero crossover position ---; "the said period" in line 14 and in line 15 should be changed to --- a period ---; and "the interval" in line 17 should be changed to --- an interval ---.

Regarding Claim 32, claim 32 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. In particular, the limitation "360 degree" has been recited in line 5 of the parent claim 31.

Regarding claim 43, "a said wavelet" in line 8 should be changed to --- a wavelet --- since the exact term "wavelet" has not been recited before in the claim; "the said wavelet" in line 14 should be changed to --- the wavelet ---; "the said period of a

wavelet" in lines 15-16 should be changed to --- the period of the wavelet ---; and "the interval" in line 17 should be changed to --- an interval ---.

Regarding Claim 44, claim 44 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. In particular, the limitation "360 degree" has been recited in line 5 of the parent claim 43.

Regarding claims 62 and 63, "corresponding [to said] to said secondary states" in the last line of claim 62 needs to be corrected (delete [to said]).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 26-30 and 62 are rejected under 35 U.S.C. 102(b) as being anticipated by Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter).

Regarding claim 1, Hiramatsu discloses a method for transmitting binary information from an information stream, comprising the steps of:

(a) generating an R.F. carrier at a select carrier frequency and exhibiting a waveform with a continuous sequence of wavelets each being defined by a 360 degree between crossover positions each of which represents a substantially zero energy level (14 in Fig. 3; also see Fig 8(B) the signal contains several 360-degree cycles between crossover positions);

(b) receiving said information stream as a given sequence of first and second binary signals (11 in Fig. 3);

(c) synchronizing said sequence of first and second binary signals with said carrier continuous sequence of wavelet crossover positions to provide synchronizing control outputs corresponding with said first and second binary signals (as shown in Figs. 8(A) and 8(B), the edge of the binary data is synchronized with the crossover positions of the carrier signal, therefore, there are implicitly synchronizing control outputs),

(d) modulating said carrier in response to said synchronizing control outputs by terminating said carrier between an integer number of wavelets defining crossover positions to derive a said first binary signal and transmitting an integer number of said wavelets between said crossover positions within said sequence to derive a said second binary signal permitting said carrier modulation termination and transmission to persist for an interval of at least an integer number of full cycle wavelets (12, 13 in Fig. 3, also see the output of 13 in Fig. 8(B), that is, the carrier is modulated by a on-off keying signal; also see col. 3, lines 60-65; also note that Fig. 8B clearly shows an

integer number of full cycle wavelets have been turned on and off according to the binary data in Fig. 8(A)); and

(e) broadcasting said modulated carrier (19 in Fig. 3).

Regarding claim 2, said step (d) for modulating said carrier is carried out by switching said carrier off and on in response to said synchronizing control outputs without effecting a sideband generating distortion thereof (as shown in Fig. 8(B), the carrier is turned on and off according to the binary data).

Regarding claim 26, Hiramatsu discloses a method for transmitting binary information from an information stream, comprising the steps of:

(a) generating a sinusoid defining R.F. carrier (14 in Fig. 3A);

(b) receiving said information stream as a sequence of binary signals (11 in Fig. 3A);

(c) modulating said carrier in correspondence with said sequence of binary signals by terminating an integer number of sinusoidal wavelet portions of said carrier without substantially affecting frequency expanding distortion of said sinusoidal carrier (12, 13 in Fig. 3A; also see Fig. 8B for the output of 13, that is, the carrier is modulated by a on-off keying signal; also see col. 3, lines 60-65; also note that Fig. 8B clearly shows an integer number of full cycle wavelets have been turned on and off according to the binary data in Fig. 8(A)); and

(d) broadcasting said modulated carrier (19 in Fig. 3A).

Regarding claim 27, wherein said step (c) is carried out by effecting said terminating of portions of said carrier by terminating at least one full cycle of said sinusoid (as shown in Fig. 8(B), at least one full cycle of the sinusoid is terminated).

Regarding claim 28, wherein said step (c) is carried out by selectively switching said carrier on and off for at least one full cycle of said sinusoid at the crossover locations thereof defining a cycle (as shown in Fig. 8B, the sinusoid is turned on or off at the crossover locations).

Regarding claim 29, wherein said step (c) for modulating said carrier is carried out by synthesizing said carrier as a sequence of full cycle wavelets, the presence and absence of which corresponds with first and second binary components of said binary information (as shown in Figs. 8A and 8B, the carrier is present when the binary data is one and the carrier is present when the binary data is zero).

Regarding claim 30, wherein each said full cycle wavelet is substantially a sinusoid which extends between a zero cross-over location at the commencement of a positive-going half-cycle and terminates at a zero cross-over location terminating a negative half-cycle (as shown in Fig. 8(B), the carrier is turned on at the positive-going zero cross-over location and is turned off at the a zero-cross location terminating a negative half-cycle).

Regarding claim 62, Hiramatsu teaches a modulated radio frequency carrier capable of transmitting a binary information stream (Fig. 8(A)) made up of first and second binary states comprising:

a carrier frequency waveform made up of a continuous sequence of wavelets (14 in Fig. 3);

said wavelets being defined by a 360 degree cycle between crossover positions; said crossover positions representing a substantially zero energy level (the signal shown in Fig. 8(B) contains several 360-degree cycles between crossover positions), the ; and

said wavelets having being modulated (12, 13 in Fig. 3B) in accordance with said information stream by having deleted an integer number of said wavelets corresponding to said first binary state of said information stream and not having deleted an integer number of said wavelets corresponding to said second binary states of said information stream (see the output of 13 in Fig. 8(B), that is, the carrier is modulated by a on-off keying signal; also see col. 3, lines 60-65; also note that Fig. 8B clearly shows an integer number of full cycle wavelets have been turned on and off according to the binary data in Fig. 8(A)).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 3, 31, 32, 38, 42, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Billings et al. (U.S. Patent No. 4,245,184, "Billings" hereinafter).

Regarding claim 3, Hiramatsu teaches the claimed invention (see the rationale applied to claim 1 above), but does not particularly mention that the step of synchronizing said binary signals with said carrier sequence wavelet crossover positions includes a step of phase tracking said carrier to provide a phase signal identifying said crossover positions. Billings teaches that a means for zero crossover synchronization both upon on and off conditions (lines 9-11 in the abstract) would require a zero crossover circuit (40 in Fig. 1; col. 3, lines 40-41). The zero crossover circuit produces a signal indicative of zero crossover positions (lines 10-14 of claim 1). It is clear that, in order to synchronize the edge of the binary signals with the zero crossover positions of the carriers as shown in Figs. 8(A) and 8(B) of Hiramatsu, the zero crossover positions need to be detected. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that a zero crossover circuit is explicitly required to indicate the zero crossover positions of the carriers and thereby to permit synchronization of the binary signals with the zero crossover positions of the carrier.

Regarding claim 31, Hiramatsu discloses a system for transmitting binary information from a digital information stream, comprising:

a transmission assembly including:

a local oscillator generating an R.F. carrier at a select carrier frequency exhibiting a waveform with a continuous sequence of wavelets each exhibiting a period of 360 degrees defined between zero crossover positions (14 in Fig. 3A; also see Fig 8(B) the signal contains several 360-degree cycles between crossover positions);

a synchronizer assembly responsive to said information stream and deriving synchronizing control outputs corresponding with first and second binary signals representing said binary information (12 in Fig. 3A; as shown in Figs. 8(A) and 8(B), the edge of the binary data is synchronized with the crossover positions of the carrier signal, therefore, there are implicitly synchronizing control outputs from 12);

a modulator assembly responsive to said R.F. carrier and to said synchronizing control outputs for deriving a transmission output by switching said R.F. carrier off at a said crossover position for the said period of an integer number of said wavelets to define said first binary signal and for transmitting said carrier for the said period of an integer number of said wavelets to define said second binary signal permitting said carrier modulation termination and transmission to persist for an interval of at least an integer number of full cycle wavelets (13 in Fig. 3A; also see Fig. 8B for the output of 13, that is, the carrier is modulated by a on-off keying signal; also see col. 3, lines 60-65; also note that Fig. 8B clearly shows an integer number of full cycle wavelets have been turned on and off according to the binary data in Fig. 8(A)); and

an R. F. transmission assembly including an antenna and responsive to said transmission output for effecting the broadcast thereof at said select carrier frequency as a broadcasted transmission output (18, 19 in Fig. 3A); and

a receiving assembly including:

a receiving antenna assembly responsive to said broadcasted transmission output to derive an antenna output corresponding therewith (21 in Fig. 3B),

a filter assembly responsive to said antenna output for deriving a received modulated carrier signal (25 in Fig. 3B); and

a demodulator assembly responsive to said received modulated carrier signal to detect the respective absence and presence of said wavelets to derive received binary information corresponding with said binary information from said digital information stream (26, 27 in Fig. 3B).

Hiramatsu does not particularly mention a phase tracking assembly responsive to said carrier and having a crossover output at said crossover positions defining a said wavelet. Billings teaches that a means for zero crossover synchronization both upon on and off conditions (lines 9-11 in the abstract) would require a zero crossover circuit (40 in Fig. 1; col. 3, lines 40-41). The zero crossover circuit produces a signal indicative of zero crossover positions (lines 10-14 of claim 1).

It is clear that, in order to synchronize the edge of the binary signals with the zero crossover positions of the carriers as shown in Figs. 8(A) and 8(B) of Hiramatsu, the zero crossover positions need to be detected. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that a zero crossover circuit is explicitly required to indicate the zero crossover positions of the carriers and thereby to permit synchronization of the binary signals with the zero crossover positions of the carrier.

Regarding claim 32, as shown in Fig. 8(B) of Hiramatsu, the signal contains several cycles between crossover positions, wherein each cycle (wavelet) represents a sinusoid of 360°.

Regarding claim 38, the filter assembly of Hiramatsu is a band-pass filter (25 in Fig. 3B).

Regarding claim 42, Hiramatsu also teaches a squaring amplifier (26 in Fig. 3B, note that the outputs of 26 are square waves).

Regarding claim 43, Hiramatsu discloses an apparatus for transmitting binary information from an information stream, comprising:

a local oscillator generating an R.F. carrier at a select carrier frequency, exhibiting a waveform with a continuous sequence of wavelets each extending between zero crossover positions defining wavelet periods of 360 degrees and exhibiting substantially zero electromagnetic wave energy (14 in Fig. 3A; also see Fig 8(B) the signal contains several 360-degree cycles between crossover positions);

a synchronizer assembly responsive to said information stream and deriving synchronizing control outputs corresponding with first and second binary signals representing said binary information (12 in Fig. 3A; as shown in Figs. 8(A) and 8(B), the edge of the binary data is synchronized with the crossover positions of the carrier signal, therefore, there are implicitly synchronizing control outputs from 12);

a modulator assembly responsive to said R.F. carrier and to said synchronizing control outputs and deriving a transmission output by switching said R.F. carrier off at a said crossover position for an integer number of the period of the wavelet to define said

first binary signal and for transmitting said carrier for at least an integer number of the period of the wavelet commencing and ending with said crossover position to define said second binary signal permitting said carrier modulation termination and transmission to persist for an interval of at least an integer number of full cycle wavelets (13 in Fig. 3A; also see Fig. 8B for the output of 13, that is, the carrier is modulated by a on-off keying signal; also see col. 3, lines 60-65; also note that Fig. 8B clearly shows an integer number of full cycle wavelets have been turned on and off according to the binary data in Fig. 8(A)); and

an R.F. transmission assembly, including an antenna responsive to said transmission output for effecting the broadcast thereof (18, 19 in Fig. 3A).

Hiramatsu does not particularly mention a phase tracking assembly responsive to said carrier and having a crossover output at said crossover positions defining a said wavelet. Billings teaches that a means for zero crossover synchronization both upon on and off conditions (lines 9-11 in the abstract) would require a zero crossover circuit (40 in Fig. 1; col. 3, lines 40-41). The zero crossover circuit produces a signal indicative of zero crossover positions (lines 10-14 of claim 1).

It is clear that, in order to synchronize the edge of the binary signals with the zero crossover positions of the carriers as shown in Figs. 8(A) and 8(B) of Hiramatsu, the zero crossover positions need to be detected. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that a zero crossover circuit is explicitly required to indicate the zero crossover positions

of the carriers and thereby to permit synchronization of the binary signals with the zero crossover positions of the carrier.

Regarding claim 44, as shown in Fig. 8(B) of Hiramatsu, the signal contains several cycles between crossover positions, wherein each cycle (wavelet) represents a sinusoid of 360°.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Najarian (U.S. Patent No. 6,151,278).

Hiramatsu teaches the claimed invention (see the rationale applied to claim 1 above), but does not teach the step of filtering the harmonics from the modulated carrier. Najarian teaches the step of filtering to suppress output harmonics of in an on-off keying (OOK) modulation transmitter. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the step of filtering to remove output harmonics in the OOK transmitter of Hiramatsu, so as to improve the output signal quality.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Tsutsumi (JP 59-10060).

Hiramatsu teaches the claimed invention (see the rationale applied to claim 1 above), but does not teach transmitting plural bits simultaneously using plural RF

carriers each having a unique carrier frequency, wherein each bit of the plural bits is assigned with a unique carrier. Tsutsumi teaches transmitting plural bits (①-⑧ in Fig. 1) simultaneously using plural carrier signals. Each bit is represented by a unique carrier (12 in Fig. 1). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to transmit plural bits simultaneously, as taught by Tsutsumi, so as to increase the data rate.

8. Claims 6, 7, 8, 19, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Bien (U.S. Patent No. 5,105,165) and Green, Jr. (U.S. Patent No. 5,266,506).

Regarding claims 6, 7, 8, 19 and 20, Hiramatsu teaches the claimed invention (see the rationale applied to claim 1 above) including the steps of providing a receiver assembly having an antenna exhibiting a broadband reception characteristic (21 in Fig. 3B), submitting the received signal to a narrow band filtering stage to provide a filtered output (25 in Fig. 3B), deriving a binary information stream from the filtered output (26, 27 in Fig. 3B), and providing said binary information stream at a receiver output (output of 27 in Fig. 3B), but does not teach the step of amplifying the antenna output to provide a received signal without effecting distortion of said antenna output. Bien teaches that, to increase the sensitivity of a receiver, a preamplifier is coupled to an antenna. The preamplifier serves to boost weak input signals to overcome the internal noise of the receiver, allowing the receiver to receive weaker signals (col. 1, lines 28-33). Green, Jr.

teaches that a preamplifier is usually a Class-A amplifier, typically, the most distortion-free of all amplifier classes (col. 1, lines 61-63). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to couple a Class-A preamplifier to the antenna of Hiramatsu, so as to increase the sensitivity of the receiver without introducing distortion.

Regarding claim 22, Hiramatsu also teaches a squaring amplifier (26 in Fig. 3B, note that the outputs of 26 are square waves).

9. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Bien (U.S. Patent No. 5,105,165) and Green, Jr. (U.S. Patent No. 5,266,506) as applied to claim 19 above, and further in view of Ella (U.S. Patent No. 6,081,171).

As explained above, Hiramatsu in view of Bien and Green, Jr. teaches the claimed invention, but does not specifically teaches that the step of submitting the received signal to a narrow band filtering stage is carried out with a crystal implemented RF filter. Ella teaches that the advantage of employing crystal implemented passband filters is the better stopband attenuation characteristics provided by these filters (col. 10, lines 43-50). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a crystal implemented bandpass filter of the system of Hiramatsu in view of Bien and Green, Jr., for the advantage of better stopband attenuation.

10. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Cronyn (U.S. Patent No. 5,223,840).

Regarding claim 23, Hiramatsu teaches the claimed invention (see the rationale applied to claim 1 above) including a gate circuit (13 in Fig. 3A) responding to the first binary signal and the RF carrier to generate a wavelet at said select carrier frequency and responding to the second binary signal to provide the absence of the wavelet, but does not specifically indicate that the gate circuit is a synthesizer. Cronyn teaches the advantage of using a direct digital synthesizer as a signal generator is that returning is fast and higher resolution (col. 7, lines 24-27). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a direct digital synthesizer in place of the gate circuit of Hiramatsu because of the advantage of faster generation and higher resolution.

11. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Cronyn (U.S. Patent No. 5,223,840) as applied to claim 23 above, and further in view of Najarian (U.S. Patent No. 6,151,278).

Regarding claim 24, Hiramatsu in view of Cronyn teaches the claimed invention (see the rationale applied to claim 23 above), but does not teach the step of filtering the synthesized modulated carrier to enhance the integrity thereof. Najarian teaches the step of filtering to suppress output harmonics of in an on-off keying (OOK) modulation

transmitter (col. 6, lines 57-63). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the step of filtering to remove output harmonics of the synthesized modulated carrier of Hiramatsu in view of Cronyn, so as to improve the output signal quality.

Regarding claim 25, as explained above in the rationale applied to claim 23, Cronyn teaches a direct digital synthesizer.

12. Claims 35 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Green, Jr. (U.S. Patent No. 5,266,506).

Regarding claim 35, Hiramatsu teaches the claimed invention (see the rationale applied to claim 31 above) including a transmission amplifier (18 in Fig. 3A) coupled to the antenna, but does not specify that the transmission amplifier is a Class-A amplifier. Green, Jr. teaches that the Class-A amplifier is the most distortion-free amplifier of all amplifier classes (col. 1, lines 61-63). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a Class-A amplifier to as the transmission amplifier, so as to increase the gain of the transmitting signals without introducing distortion.

Regarding claim 47, Hiramatsu teaches the claimed invention (see the rationale applied to claim 43 above) including a transmission amplifier (18 in Fig. 3A) coupled to the antenna, but does not specify that the transmission amplifier is a Class-A amplifier. Green, Jr. teaches that the Class-A amplifier is the most distortion-free amplifier of all

amplifier classes (col. 1, lines 61-63). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a Class-A amplifier to as the transmission amplifier, so as to increase the gain of the transmitting signals without introducing distortion.

13. Claims 36 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Najarian (U.S. Patent No. 6,151,278).

Regarding claim 36, Hiramatsu teaches the claimed invention (see the rationale applied to claim 31 above), but does not teach the step of filtering the modulated carrier to enhance the integrity thereof. Najarian teaches the step of filtering to suppress output harmonics of in an on-off keying (OOK) modulation transmitter (col. 6, lines 57-63). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the step of filtering to remove output harmonics of the modulated carrier of Hiramatsu, so as to improve the output signal quality.

Regarding claim 48, Hiramatsu teaches the claimed invention (see the rationale applied to claim 43 above), but does not teach the step of filtering the modulated carrier to enhance the integrity thereof. Najarian teaches the step of filtering to suppress output harmonics of in an on-off keying (OOK) modulation transmitter (col. 6, lines 57-63). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the step of filtering to remove output

harmonics of the modulated carrier of Hiramatsu, so as to improve the output signal quality.

14. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Billings et al. (U.S. Patent No. 4,245,184, "Billings" hereinafter) as applied to claim 31 above, and further in view of Bien (U.S. Patent No. 5,105,165) and Green, Jr. (U.S. Patent No. 5,266,506).

Hiramatsu in view of Billings teaches the claimed invention (see the rationale applied to claim 31 above), but does not teach the step of pre-amplifying the antenna output to provide a received signal using a Class-A amplifier. Bien teaches that, to increase the sensitivity of a receiver, a preamplifier is coupled to an antenna. The preamplifier serves to boost weak input signals to overcome the internal noise of the receiver, allowing the receiver to receive weaker signals (col. 1, lines 28-33). Green, Jr. teaches that a preamplifier is usually a Class-A amplifier, typically, the most distortion-free of all amplifier classes (col. 1, lines 61-63). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to couple a Class-A preamplifier to the antenna of Hiramatsu/Billings, so as to increase the sensitivity of the receiver without introducing distortion.

15. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Billings

et al. (U.S. Patent No. 4,245,184, "Billings" hereinafter) as applied to claim 31 above, and further in view of Ella (U.S. Patent No. 6,081,171).

As explained above with respect to claim 31, Hiramatsu in view of Billings teaches the claimed invention including the filter assembly is a band-pass filter (25 in Fig. 3B), but does not specifically teaches that the band-pass filter comprises a crystal implemented RF filter. Ella teaches that the advantage of employing crystal implemented passband filters is the better stopband attenuation characteristics provided by these filters (col. 10, lines 43-50). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a crystal implemented bandpass filter of the system of Hiramatsu in view of Bien and Green, Jr., for the advantage of better stopband attenuation.

16. Claim 63 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al. (U.S. Patent No. 5,136,614, "Hiramatsu" hereinafter) in view of Najarian (U.S. Patent No. 6,151,278).

Hiramatsu teaches the claimed invention (see the rationale applied to claim 62 above), but does not teach filtering the harmonics of the modulated radio frequency carrier modulated carrier. Najarian teaches a filter to suppress output harmonics of in an on-off keying (OOK) modulation transmitter (col. 6, lines 57-63). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a filter to remove output harmonics of the modulated carrier of Hiramatsu, so as to improve the output signal quality.

Allowable Subject Matter

17. Claims 4, 10-18, 33, 34, 39, 40, 45 and 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 10-18 also need be rewritten to overcome the claim objections stated in Paragraph 1 of this Office Action.

Claims 49-54 are allowed.

18. The following is a statement of reasons for the indication of allowable subject matter:

Claim 4 is allowable over the prior art of record because the prior art of record does not teach or suggest the step (c) effects said combining of said phase signal with said sequence of first and second binary signals with select delays for permitting said carrier modulation termination and transmission to persist for the interval of at least a full cycle wavelets.

Claims 10-14 are allowable over the prior art of record because the prior art of record does not teach or suggest the steps of providing a receiver local oscillator having a select mixing frequency output and mixing said mixing frequency output with said received modulated carrier signal to derive a mixed output exhibiting intermediate frequency components.

Claims 15-18 are allowable over the prior art of record because the prior art of record does not teach or suggest the steps of providing a receiver local oscillator having a select mixing frequency output and mixing said mixing frequency output with said received modulated carrier signal to derive a mixed output exhibiting unique intermediate frequency components corresponding with the frequencies of said n R.F. carriers.

Claims 33 and 34 are allowable over the prior art of record because the prior art of record does not teach or suggest that the synchronizer assembly includes an ANDing assembly having said synchronizing control outputs upon the synchronized occurrence of said first and second binary signals with a said crossover output.

Claims 39, 45 and 46 are allowable over the prior art of record because the prior art of record does not teach or suggest a second class A amplifier stage responsive to said amplified received modulated carrier signal for deriving said received binary information in rectangular wave from.

Claim 40 is allowable over the prior art of record because the prior art of record does not teach or suggest a digital signal processor responsive to said reference output and to said amplified received modulated carrier signal to effect a comparison therebetween and propagate said first binary signal in absence of a said wavelet and said second binary signal in the presence of a wavelet at said amplified received modulated carrier signal.

Claims 49-54 are allowable over the prior art of record because the prior art of record does not teach or suggest a receiver local oscillator having a select mixing

frequency output and a mixer assembly responsive to said select mixing frequency output and to said antenna output to derive a mixing output exhibiting intermediate frequency components.

Response to Arguments

19. Applicant's arguments filed 5/6/04 have been fully considered but they are not persuasive.

The applicants argue that Hiramatsu's system keys on and off at the zero crossing points as shown in Fig. 8 of the Hiramatsu reference is merely a drawing convention and not meant to display how the Hiramatsu system works. None of the prior art cited by the Examiner alone or in combination discloses the deletion of an integer number of discrete wavelets. The applicants further argue that the Hiramatsu and other disclosure s in no way suggest an invention of a very narrowband signal and method of data transmission as claimed in Applicants' application.

Examiner's response --- The applicants are reminded that the drawings are part of the disclosure. The drawings of Hiramatsu are self-explanatory and do not need further explanation in the specification. Fig. 8 of Hiramatsu clearly shows that the system keys on and off at the zero crossing points. In fact, as shown in Figs. 8(A) and 8(B), Hiramatsu specifically uses dashed lines to indicate that the edges of the binary data correspond to the zero crossing points.

Further, in response to the applicants' argument that none of the prior art cited by the Examiner alone or in combination discloses the deletion of an integer number of discrete wavelets, Hiramatsu does teach the deletion of an integer number of discrete wavelets. In particular, Hiramatsu teaches that oscillator 14 generates a carrier signal of 300 MHz (col. 3, line 64) and the signal width of the on-off keying signal is 120 microseconds (col. 5, lines 63-64). Therefore, Hiramatsu clearly teaches the deletion of an integer number (i.e., 36000) of discrete wavelets. The argument is not persuasive.

Lastly, in response to the applicants' argument that there is no way Hiramatsu suggests an invention a very narrowband signal and method of data transmission as claimed in Applicants' application, it is noted that the features upon which applicant relies (i.e., narrowband signal) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In fact, the specification never defines what range of bandwidth is called a "narrowband". Further, as shown in Fig. 3A of Hiramatsu, the so-called wideband signal is a result of consequent spread spectrum modulation 15. The output of the gate 13 is a narrowband signal (assuming a vague definition that a non-spread spectrum signal is a narrow signal).

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (703) 305-0198. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703) 305-4714. The fax phone numbers

for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.

Chieh M Fan
Primary Examiner
Art Unit 2634

cmf
July 19, 2004